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(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Pulverulent Cleaning Agent

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Notice: The specification contained herein as filed

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PULVERULENT CLEANING AGENT

The present invention relates to a pulverulent cleaning agent for textile surfaces, particularly textile floor coverings, containing a vehicle material to which water has been added, a cleaning-active substance, possibly solvent and possibly further addition substances.

Various embodiments of such cleaning agents are already known. With regard to the state of the art, reference is had, by way of example, to Federal Republic of Germany Patent 27 32 011.

In the known cleaning agents, various organic and inorganic substances have already been proposed as vehicle materials - for instance sawdust, ground cork, diatomaceous earth, etc. Only urea-formaldehyde foams, and cellulose powder have, however, up to now acquired any substantial importance, in any event for the use of such cleaning agents in households. The use of these last-mentioned substances is open to criticism for various reasons. In the case of the formaldehyde foams, reference may be had to the possible injurious effect of formaldehyde on one's health. In cleaning agents containing a vehicle material having a base of powdered cellulose, a high proportion of bleached native cellulose plants which are several years old is required. The production of powdered cellulose furthermore results in a very large amount of waste water and, despite the introduction of new methods of digestion for the recovery of the cellulose, it strongly pollutes the environment. A reduction in the cellulose content of known pulverulent cleaning agents, however, leads to products which, upon being worked for instance into a carpet, "clog," definitely clean more poorly, are difficult to vacuum off, and require long drying times. Furthermore the products are then no longer "pourable."

Starting from the prior art described, the object of the present invention is to provide a pulverulent cleaning agent for textile surfaces which, while providing the highest possible

effectiveness in cleaning, is saving in raw material and, at the same time, gets along without any, or with only small amounts of, health-injurious or environment-incompatible substances.

This object is achieved by the invention in the manner that the vehicle material is formed by highly absorptive, swollen polymer particles and by organic fiber particles attached on the surface thereof.

In accordance with the invention, there are used as vehicle material polymer particles which being highly absorptive in dry state are then swollen - so called "super absorbers," together with organic fiber particles which are attached to the surface of the polymer particles. The highly absorptive, swollen polymer particles create the necessary bulk and surface by a high percentage of water bound in the polymer particles. As a result, the use of expensive raw materials and, in particular, bleached cellulose, can be greatly reduced. The vehicle material or absorbent material is completely available to the surface of the carpet. It tends to form agglomerates, so that it does not "sand" in the carpet. The organic fiber particles are attached to the surface of the swollen polymer particles. They are therefore distributed excellently and only a small amount of organic fiber particles is required. Another essential advantage is that very different formulations of the cleaning agent are possible. For example, the cleaning agent can easily be placed in "wet" or "dry" form, as explained in detail further below. As a further development, the polymer particles may consist of a polyacrylate. One such polyacrylate is known, in particular, under the trade name "Favor," distributed by the Stockhausen Company of Krefeld. A cross-linked polyacrylic acid, present in part as sodium salt, is particularly preferred. Such highly absorptive polymers described also in the literature reference "Allgemeiner Vliesstoff Report 4 - 1984, pp. 178-182," can absorb

several times their own weight of aqueous liquids. In this way a gel is formed, the nature of which, however, may differ. Such highly absorptive polymers release the aqueous liquid -- in general ordinary water -- which they have absorbed only to a relatively slight extent, if at all, even under pressure. In accordance with the invention it is preferred that the gel have the nature of a granular mass (caviar structure). In this way, very small polymer particles of spherical structure are formed, of a diameter of about 10 to 1,000  $\mu\text{m}$  in swollen state. Accordingly, a very large surface results. The organic fibers may have a diameter of 5 to 30  $\mu\text{m}$  and a length of 50 to 400  $\mu\text{m}$ . They preferably are cellulose fibers.

For manufacture, one proceeds in the manner that the polymer consisting of sodium polyacrylate (or of the said polyacrylic acid) is treated with water until it is saturated. The polyacrylate thereby swells and develops the aforementioned caviar structure. One gram of polyacrylate can absorb several times its weight of water, for instance, up to 100 g. The polyacrylate does not give off the absorbed water, even under pressure. By an addition of more water, which is no longer absorbed by the polyacrylate, the "wet" type can be produced. The swollen polyacrylate is then mixed with the cellulose fibers, which attach themselves essentially to the surface of the polyacrylate particles. The powder thus obtained is then treated further with the required wash-active substance, generally an aqueous surfactant solution. In addition, a solvent may be added and perhaps other addition substances, as well as, possibly, fragrances.

Such a pulverulent cleaning agent may contain 5 to 75 % by weight of swollen acrylate, and preferably 25 to 35 % by weight. Furthermore, 10 to 50 wt.% of organic fibers, there entering into consideration here, in addition to cellulose, also linters

and chemically or mechanically modified cellulose, as well as similar substances. The proportion is preferably between 25 and 35 wt.%, a cellulose powder having a particle size spectrum of 50 to 350  $\mu\text{m}$  being used. In addition, it may contain about 5 to 35 wt.% of water, preferably 20 to 25 wt.%. 0 to 20 wt.%, and preferably also, once again, 5 to 15 wt.%, can be organic solvents, for instance, methoxypropanol or aromatics-free benzine. 0 to 7 wt.% can be a surfactant or a surfactant mixture. It is, in particular, an anionic, non-ionic, cationic or amphoteric surfactant. This proportion is preferably 0.5 to 2 wt.%. Finally, 0 to 5 wt.%, and preferably 0 to 2 wt.%, of further customary adjuvants and aromas, such as, for instance, preservatives, anti-statics, etc.

Two formulas are indicated below by way of example:

Illustrative Formula I:

<u>Vehicle Materials</u>	<u>Quantity (Wt. %)</u>
Cellulose:	45.00
For example, Arbocel B 820 C	
Arbocel fd 00	
Arbocel TP 40	
Technocel 90 DU with 10%	
Technocel 300 BL	
Arbocel B 00 with 15%	
LIC 200	
Favor CT (swollen acrylate)	5.00
(corresponds to 0.025% Favor with 4.975% water)	
<u>Active-Substance Solution:</u>	
Water	33.50
Surfactant	5.0
(For example, Rewopol V 2800)	(corresponding to 1% wash-active substance)
Defoamer	
(For example, Baysilon AC 3099)	0.05

Antistatic (For example, Statexan)	0.15
Perfume oil (Kobofleur)	0.10
Isopropanol	1.00
Preservative (For example, Acticid SPX)	0.20

Solvent:

for example, Isopar J	10.00
	100.00
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Illustrative Formula II:

<u>Vehicle Materials</u>	<u>Quantity (Wt. %)</u>
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<u>Cellulose:</u>	30.00
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For example, Arbocel B 00 with 50% Arbocel

LiC 200

Arbocel fd 00 with 30% Arbocel

FiC 200

Arbocel B 820 C with 10%

FiC 200

Favor CT (swollen acrylate) (corresponds to 0.15% Favor with 29.85% water)	30.00
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Active Substance Solution:

Water	23.60
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Surfactant (For example, Rewopol V 2800)	5.00 (corresponding to 1% wash-active substance)
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Defoamer (For example, Baysilon AC 3099)	0.05
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Antistatic (For example, Statexan)	0.05
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Perfume oil (Kobofleur)	0.10
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Isopropanol	1.00
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Preservative (For example, Acticid SPX)	0.20
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Solvent:

For example, Isopar J

10.00
100.00
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The above formulas are prepared approximately as follows for an amount of 150 kg (values for Formula I within parentheses):

First of all the acrylate dispersion of 0.23 kg (0.04 kg) Favor CT and 44.78 kg (7.46 kg) water is stirred. Depending on the desired viscosity of the dispersion, they can furthermore be diluted with water from the active-substance solution.

The components of the active-substance solution (33.43 kg (47.30 kg) water; 7.50 kg (7.50 kg) surfactant solution; 0.08 kg (0.08 kg) defoamer; 0.15 kg (0.23 kg) antistatic; 0.15 kg (0.15 kg) perfume oil; 1.50 kg (1.50 kg) isopropanol and 0.30 kg (0.30 kg) preservative) are mixed in a separate tank.

46.97 kg (70.46 kg) of cellulose powder (4.2% moisture) are introduced into a plowshare mixer. With the mixer operating, the acrylate dispersion is first of all sprayed thereon by means of a diaphragm pump, followed then by the active-substance solution, and finally by 15.0 kg (15.0 kg) of benzine.

In both cases a white pourable powder having a dry feel is produced.

The above-indicated "wash-active substance" reference has the meaning that 5% of aqueous surfactant mixture corresponds to 1% pure surfactant portion of "wash-active substance." The isopropanol mentioned serves as solvent for the fragrance added to the agent. It is otherwise contained in the surfactant mixture mentioned in the application.

The features of the invention disclosed in the above description and the claims can be of importance both individually and in any desired combination for the reduction to practice of the invention.

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A pulverulent cleaning agent for textile surfaces, in particular textile floor coverings, containing a vehicle material to which water has been added, a cleaning-active substance, possibly a solvent, and possibly other addition substances, characterized in that the vehicle material is formed by highly absorptive, swollen polymer particles and by organic fiber particles attached on the surface thereof.
2. A cleaning agent according to claim 1, wherein the polymer particles consist of a polyacrylate.
3. A cleaning agent according to claim 2, wherein the polymer particles consist of cross-linked polyacrylic acid, present in part as sodium salt.
4. A cleaning agent according to claim 1, wherein the polymer particles are ground, with a diameter of 10 to 1000  $\mu\text{m}$  in swollen state.
5. A cleaning agent according to claim 1, wherein the cleaning agent contains:
  - 5 to 75 wt.% of swollen polymer particles;
  - 10 to 50 wt.% of organic fibers;
  - 5 to 40 wt.% of water;
  - 0 to 20 wt.% of organic solvent;
  - 0 to 3 wt.% of anionic, non-anionic, cationic or amphoteric surfactant or surfactant mixture; and
  - 0 to 5 wt.% of other ordinary auxiliary substances and fragrances.
6. A cleaning agent according to claim 1, containing
  - 35 to 55 wt.% of swollen polymer particles;



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25 to 35 wt.% of powdered cellulose;  
20 to 25 wt.% of water;  
5 to 15 wt.% of aromatic-free benzine;  
3 to 7 wt.% of surfactant mixture; and  
0 to 2 wt.% of auxiliary substances.

7. A cleaning agent according to claim 1, wherein the organic fibers have a diameter of 5 to 30  $\mu\text{m}$  and a length of 50 to 400  $\mu\text{m}$ .

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## ABSTRACT OF THE DISCLOSURE

The present invention relates to a pulverulent cleaning agent for textile surfaces, particularly textile floor coverings, containing a vehicle material which has been treated with water, a cleaning-active substance, possibly solvent, and possibly other addition substances, and in order to obtain a pulverulent cleaning agent which contains only slight, if any, substances considered injurious to one's health and incompatible with the environment, the vehicle material is formed of highly absorptive, swollen polymer particles and organic fiber particles attached to the surface thereof.

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